

Architecture 535 "Case Studies in Building Environmental Technology"

Time: 8:30 - 11:30 AM, Wednesday, including the Workshops' time.(Jan 7th to April 21st)
Class: In-person, Rm 2119, Art & Arch, Bldg.
Laboratories: BT Computer Lab, Rm 2119, Lab. MIDEN – UM-VR Lab.
Office Hours: M/W: 11:30-1:00 PM
Instructor: Mojtaba Navvab, Ph.D., FIES, [Email: moji@umich.edu](mailto:moji@umich.edu)
Pre-requisite: Graduate standing or permission of instructor

Description:

In this course, several buildings are studied regarding the influence of building environmental control systems on occupants' comfort. The course participants will evaluate the envelopes of selected award-winning design buildings for their environmental control systems and high-performance design. Basic sizing of the building systems is performed. Other areas of interest include case studies on building automation, data collection, and controls for various building types, as well as building operations and maintenance. Energy, daylighting, lighting, and acoustic performance analysis are performed for selected building types. Participants can develop their building design under a given climatic condition and work individually or as a team.

Objectives:

- 1) To understand environmental technology design techniques through case studies.
- 2) To evaluate building system design and its compliance with building standards.

Methodology:

A case study is a research methodology. Case studies are often used in exploratory research. They can help us generate new ideas (other methods might test that). They are an essential way of illustrating theories and, in this course, can help to show how different aspects of a building technology are related to each design objective; see possible examples: <https://xr.engin.umich.edu/architecture-lighting-miden/>

Seminar Topics

Environmentally responsive site planning,
Environmentally preferable materials and products, High-performance HVAC
High-Performance Electric Lighting and Daylighting Influence of Climate Change on Occupants' Comfort LEED application and compliance

ASHRAE Standards application and compliance with
Renewable energy
Superior indoor air quality
Acoustic, thermal, and visual comfort
Water efficiency
Building commissioning

Recommended Book:

Mechanical and Electrical Equipment for Buildings, Stein, B., Etl, 1992, (ISBN-0-47186937-6)

